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Relationship Between the U.S. Air Force Physical Fitness Assessment And Healthcare Utilization

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Walden University

College of Health Sciences

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Elena Arushanyan

has been found to be complete and satisfactory in all respects,
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the review committee have been made.

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Walden University
2018

Abstract

Relationship Between the U.S. Air Force Physical Fitness Assessment
and Healthcare Utilization

by

Elena E. Arushanyan

MS, Uniformed Services University of the Health Sciences, 2011

BS, Augustana College, 2001

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

February 2018

Abstract

Escalating health care costs in the military health system are not sustainable long term. Regular physical activity has been shown to improve health and reduce health care costs. Military members serving in the United States Air Force (USAF) are encouraged to maintain physical fitness year-round and undergo mandatory physical fitness assessments (PFAs) annually. The purpose of this quantitative correlational study was to determine the nature of the relationship between the timing of the PFA and health care utilization (HU) by active duty service members assigned to the United Kingdom's USAF military treatment facility. Donabedian's framework and the logic process model were used to design the study. Archived fitness and health care utilization data were obtained on 361 military members. Findings indicated a strong, positive correlation between the timing of the PFA and HU, which was strongest during the PFA month. Monthly HU 6 months prior to PFA was compared using a 1-way repeated measures ANOVA. Findings indicated a significant difference between T-1 (PFA month), T-2 (1 month prior to PFA), and T-5 (5 months prior to PFA). Paired-samples *t* tests demonstrated a statistically significant increase in HU from T-5 to T-2. Although findings are not generalizable, they signal a need for further study to evaluate HU variability between populations, to identify at-risk groups, and to inform health and fitness policies that affect the readiness and retention of military members. The DNP project may promote interdisciplinary collaboration between health care providers and senior military leadership, innovation in health care delivery, and evidence-based and cost-conscious policies.

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Dedication

First, this work is dedicated to my husband, Alexander Clifford, and my three children: Vincent Rieck, Allison Rieck, and Liliana Clifford. Their unwavering support fueled my commitment to see this project through to the end. Second, this document is dedicated to my parents, Iakov Arushanyan and Tatyana Kubyshin, who instilled in me the desire for lifelong learning. Third, this project is dedicated to my fellow nurses, in and out of uniform.

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Section 1: Nature of the Project

The Office of the Under Secretary of Defense for Personnel and Readiness (OUSDP&R, 2011) outlined five strategic goals for the fiscal years 2012-2016, one of which is “to deliver quality healthcare at an affordable cost while improving medical readiness” (p. 4). The OUSDP&R defined what constitutes success under this goal: The Active and Reserve Components are medically ready for deployment through a quality health care experience that focuses on prevention and the development of increased resiliency leading to reduction of illness, and military health system (MHS) per capita costs increase at a rate of 1% less than civilian health insurance increases. The MHS is funded by the Defense Health Program (DHP), which has four measures of performance that are consistent with this strategic goal: individual medical readiness, beneficiary satisfaction with the health plan, inpatient and outpatient production targets, and medical cost per member per year (DHP, 2016). A recent systematic review indicated that health care costs 50% more on average within the MHS compared to health care purchased from civilian partners (Institute for Defense Analyses, 2016). Medical effects of prolonged military engagement, population health changes, and more beneficiaries relying on TRICARE for health insurance have been linked to escalating health care costs within the MHS (Defense Health Agency, 2012).

Meeting physical fitness standards is a condition for continued service in the USAF (USAF, 2013). The aspiration of having a physically fit force is aligned with the national evidence-based guidelines that promote regular physical activity in hopes of improving health outcomes and reducing long-term health care costs (HHS, 2016). An

increase in fitness levels among military members was shadowed by an increase in injuries, potentially hindering members' readiness to deploy (Giovannetti, Bemben, Bemben, & Cramer, 2012). Additionally, passing a PFA does not correlate to combat type functional fitness (Worden, 2009).

The purpose of this study was to determine the relationship between the timing of fitness testing and the health care utilization rate. Prior to making an inquiry into unintended consequences of the current U.S. military health and fitness regulations, it was important to assess the relationship between these two variables. A quantitative correlational design was used to generate hypotheses and provide impetus for additional research on this topic. The findings from this project may inform health and fitness policies that directly impact men and women of the U.S. military.

Background

The Department of Defense (DOD, 2002), recognizing physical fitness as a valuable component of the overall wellness of the U.S. military, instructs the military services to create and maintain fitness programs. In turn, the USAF (2013) directs all of its associated members to maintain fitness standards 365 days a year. Specifically, all airmen are assured that leading an active lifestyle will increase productivity, optimize health, decrease absenteeism, and maintain mission readiness (USAF, 2013). The USAF delegates authority to the service members' unit commanders and supervisors to execute and enforce the fitness program, encouraging a culture of fitness among all airmen (AFI 36-2905, 2013). The USAF uses physical fitness tests to screen prospective personnel prior to entering the military service and to validate continued fitness for military service.

In the USAF, the physical fitness assessment (PFA) is administered at least once a year to all its members (USAF, 2013). The HHS (2016) created national evidence-based guidelines that promote regular physical activity in hopes of improving health outcomes and reducing health care costs long term. The USAF leadership recommends that commanders set up an environment that encourages a culture of fitness with a caveat that it supports and does not interfere with mission requirements.

Inadequate physical activity has been associated with a significant financial burden for the U.S. health care system (Carson, Fulton, Pratt, Yang, & Adams, 2014). Carson et al. (2015) merged the National Health Interview Survey (2004-2010) and the Medical Expenditure Panel Survey (2006-2011) data with the sample of 51,165 adults who were 21 years of age or older, excluding those who were pregnant or who reported being unable to do physical activity. Carson et al. discovered that 20.2% of respondents were insufficiently active and 34.2% were inactive. Carson et al. also reported the mean annual expenditure difference per capita for inactive adults was \$1,437, which was 29.9% higher than for active adults. For insufficiently active adults, the mean annual expenditure difference per capita was \$713, 15.4% higher than for active adults. After factoring in obesity in the data analysis, Carson et al. found the annual expenditure and percentage differences were slightly reduced but the differences remained significant.

Regular physical activity can result in numerous health benefits (HHS, 2016). These health benefits include lower risk of early death, coronary heart disease, stroke, high blood pressure, type 2 diabetes, breast and colon cancers, falls, and depression in adults (Office of Disease Prevention and Health Promotion, 2016). Inadequate physical

activity is associated with a significant financial burden for the U.S. health care system (Carson et al., 2015). A physically active lifestyle is encouraged among military members, with requirements to meet service specific fitness standards. If adequate physical activity is associated with positive health outcomes and lower health care costs, the same may be found in the military community.

Problem Statement

Physical fitness has been a part of the USAF culture for decades and is important to national security. All airmen are required to complete a physical fitness assessment (PFA) at least annually (USAF, 2013). Worden (2009) demonstrated that the USAF's PFA does not correlate with combat type functional readiness. Mitchell, White, and Ritschel (2012) evaluated a small sample of female military members in the USAF and discovered little association between physical and combat-based fitness assessments. Giovannetti et al. (2012) reported that although fitness levels of the military members increased, so did the injuries, precluding personnel from staying fit or deploying. At the time of the current study, there was a paucity of research on the relationship between the USAF's PFA requirement and health care utilization.

Local USAF leadership relies on units' capability to forward deploy service members, sometimes on short notice. There are many processes in place to clear a service member for deployment, which include medical and fitness components. At the study site base, the clearance process is managed by a team of providers and medical technicians dedicated to pre- and postdeployment health assessments. All other routine health care needs are taken care of by the family health clinic teams. Although access to care is

generally considered good at the study site family health clinic, obtaining additional evidence may illuminate the health care costs of supporting PFAs.

A nurse in an advanced practice role can address this gap in nursing practice and health care policy in the form of a doctoral project. The current project was consistent with the American Association of Colleges of Nursing's (AACN, 2006) position statement detailing the eight essentials of a practice-focused doctoral program. It was an evidence-based project that involved the following elements: organizational and systems leadership, clinical scholarship, utilization of information systems for the improvement and transformation of health care, informing the health policy for advocacy in health care, interprofessional collaboration, and professional growth in an advanced nursing practice role.

Purpose Statement

The purpose of this quantitative correlational study was to determine the nature of the relationship between the timing of the physical fitness assessment and health care utilization by USAF active duty service members working at the hospital in the United Kingdom. This gap in knowledge was met by systematically examining data related to the timing of the PFA and aspects of health care utilization. Senior leaders within the military health system will be apprised of the study's results via the chain of command and an appropriate presentation venue.

Nature of the Project

Sources of Evidence

Several sources of evidence were utilized, including the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medical Literature Analysis and Retrieval System Online (MEDLINE), and Association of Military Surgeons of the United States (AMSUS) databases to search for scholarly evidence that has been published within the past 5 years and available in full text. The following search terms were used: *physical fitness, fitness test, cost, health care utilization, military, and USAF*.

The contents of the scholarly documents were reviewed for quality and themes.

Additionally, the unit fitness managers assisted in obtaining the PFA data from the Air Force Fitness Management System II, a secure database used for collecting and managing military members' fitness data. Also, the hospital's group practice manager was engaged in obtaining health care utilization reports on the identified target population.

Study Design

According to Burns and Grove (2009), a quantitative correlational design is used to examine relationships among variables. This design was appropriate for this project. The target population included all active duty service members assigned to the U.K.-based USAF hospital to allow for ease of fitness data collection. Members who had pregnancy-related fitness restrictions were excluded from the study. This was determined by filtering for members who were restricted from performing all four fitness components, which included waist measurement, cardio, sit-ups, and push-ups. Existing data were obtained and de-identified in accordance with the data sharing agreement.

Fitness and health care utilization data sets were merged to create one document. Data were organized to include each member's health care utilization preceding the PFA by 6 months. SPSS software was used to perform statistical analyses to examine relationship between variables.

Theoretical Framework

Donabedian's framework was used to guide the health outcomes research. This framework focuses on approaches to quality assessment in health care classified under three categories: structure (attributes such as material resources, human resources, and organizational structure), process (what is done), and outcome (the effects of care on the health status of patients and populations) (Donabedian, 1988). For the purposes of this project, the USAF's fitness policy denoted structure, the physical fitness assessment (PFA) was the process, and various aspects of health care utilization were the outcomes.

Significance

This project may be the first of its kind in military medicine and was a necessary contribution to the body of knowledge. This doctoral project's results may serve as a precedent for continuing to inform the MHS health care delivery and the USAF's fitness policy through further research. Other branches of the U.S. military may incorporate the study's findings into their research initiatives. As health care costs continue to rise without the corresponding improvement in the quality of health care delivery, the DOD needs to be informed of programs that are either ineffective, inefficient, or not cost conscious. Future studies could address at-risk populations who could be better targeted for preventive interventions through adjustment in policy.

Summary

Scholarly evidence on the health care outcomes of the USAF's current fitness policy was lacking. This doctoral project was conducted to determine the relationship between the timing of the USAF's PFA and health care utilization using a quantitative correlational design. Donabedian's framework focusing on structure, process, and outcomes when evaluating the quality of medical care was used to guide the study. This doctoral project added to the military medicine's body of knowledge and provided senior leaders with meaningful evidence to support policy level decisions.

The concepts, models, and theories supporting the project, as well as the project's relevance to nursing practice, are discussed in the next section. Additional information on the local background and context of the study is provided. The role of the DNP student and the project team are also clarified.

Section 2: Background and Context

Over the years, the USAF's fitness policy has remained largely unchanged despite the evolution of the military health system's (MHS) health care delivery methods. At the practice level, there is a perception of more members seeking care prior to their physical fitness assessment (PFA) to obtain a fitness waiver for various health reasons. Scholarly evidence concerning the nature of the relationship between the timing of the USAF's PFA and health care utilization is lacking. The following practice-focused inquiry was used to guide the study: Among the military members assigned to the U.K.-based USAF hospital, what is the nature of the relationship between the timing of the PHA and the health care utilization rate? Answering this question may prompt further research on a larger scale, with intentions to inform current MHS health care delivery and the USAF's fitness policy.

The purpose of this study was to determine the nature of the relationship between the timing of the physical fitness assessment and the health care utilization rate among active duty service members assigned to the military treatment facility in the United Kingdom. The following sections cover the use of Donabedian's framework and the logic process model that guided this project. The relevance to nursing practice and the local context of the project, as well as my role in the study, are also discussed.

Concepts, Models, and Theories

Donabedian's framework for assessment of health care quality was used to guide the health outcomes research. This framework focuses on approaches to quality assessment in health care classified under three categories: structure (attributes such as

material resources, human resources, and organizational structure), process (what is done), and outcome (effects of care on the health status of patients and populations) (Donabedian, 1988). Kelly (2011) discussed the causal relationships between the structure, process, and outcome, highlighting how structure is relevant to quality by influencing the probability of good performance. For the purposes of this project, structure was represented by the USAF's fitness policy, process included the physical fitness assessment (PFA), and health care utilization was the outcome. According to Kelly, performance measures can be grouped using Donabedian's framework. The logic model is a process model that was used to define the elements of the USAF's fitness policy, shown in Table 1. The logic model has five phases: inputs (resources and raw materials), process (activities that use inputs to achieve objectives), outputs (measurements and completion of services), outcomes (demonstrated benefits to those receiving service), and impact (organization or system-level measurable changes) (Kettner et al., 2017). Visualizing the program's processes helps the stakeholders clarify the program's purpose, identify any necessary resources and sequencing of activities to achieve the program's objectives, and provide a basis for program evaluation (Department of Health and Human Services, n.d.). The logic model can be used for program planning and program evaluation activities.

Table 1

Description of the USAF's Fitness Program Design Using the Logic Model

Inputs	Process	Outputs	Outcomes	Impact
Service member	Maintenance of fitness	PFA standards met	Physically active lifestyle	Healthcare utilization
Fitness assessment cell staff	PFA	PFA is current	Increased productivity	Optimized health
Unit fitness program manager	PCM appointment	Member is fully or partially mission capable	Higher level of readiness	Healthcare cost
MHS staff	Specialty referral		Decrease in absenteeism	
Medical standards staff	Fitness improvement program enrollment			
Fitness center	Fitness, duty, and mobility restrictions			

Terminology and Definitions

FAC (fitness assessment cell) staff: Individuals who conduct official fitness assessments and update records.

FMC (fully mission capable): The member does not have duty, fitness, or mobility restrictions.

Medical standards staff: Individuals who monitor members' duty, fitness, or mobility status for commanders.

MTF (military treatment facility): A military facility that provides health care.

NMC (not mission capable): The member has significant duty, fitness, or mobility restrictions.

PCM (primary care manager): A member's health care provider.

PMC (partially mission capable): The member has some duty, fitness, or mobility restrictions.

UFPM (unit fitness program manager): The individual who manages the fitness program at the unit level.

Relevance to Nursing Practice

Organizational and systems leadership to improve patient and health care outcomes is critical for nurses in an advanced practice role (AACN, 2006). Few inquiries have been made regarding military fitness programs (Giovanetti et al., 2012; Mitchel et al., 2012; Worden, 2009), and none have focused specifically on health care utilization. It is possible that investigations have been performed but not published in peer-reviewed literature. Nurses have been challenged to integrate evidence-based knowledge from diverse sources and across disciplines into practice (AACN, 2006). Further, active involvement in the process of policy development and evaluation highlights the limitless potential of nurses who are fully engaged in doctoral level nursing practice.

Local Background and Context

The doctoral project took place at a military treatment facility (MTF) on a U.K.-based USAF installation where I currently work as a family nurse practitioner in a primary care setting. Due to the installation's strategic mission in Europe, active duty military members make up a greater portion of the base's total population compared to stateside locations. All active duty service members are covered under TRICARE Overseas Program Prime health insurance.

The hospital's family health clinic is staffed by 10 primary care providers including two nurse practitioners, four physician assistants, and four physicians. Each provider is empaneled with a group of service members who belong to a squadron, including their spouses and older children. For example, one provider takes care of the Security Forces Squadron and another takes care of the Aircraft Maintenance Squadron. Although primary care providers are not occupational health providers, they are required to consider the service member's occupation at each visit. Various acute and chronic health needs can often have an impact on the member's fitness, job-specific duties, and ability to deploy. Primary care providers may also notice certain health-related trends within their assigned squadrons, which can be reported to the appropriate squadron commander. Overall fitness for duty trends by squadron are monitored monthly by the Deployment Availability Working Group, a standardized process throughout the USAF. Additionally, commanders receive regular updates on their troops' fitness assessment and where the unit scores fall categorically (excellent, good, or poor).

Over the past several years, I have had the privilege of taking care of military service members and their families, both as a nurse and as a family nurse practitioner. I have observed that while striving for a certain level of physical fitness, service members require more from their health care team regarding fitness testing time frames. I have noticed that some individuals choose to maintain PFA requirements throughout the year, some choose to maintain fitness using alternate exercises and prepare for the PFA within a few months of the test, and some choose a sedentary lifestyle and have no trouble "winging it." I have also encountered military members who develop an injury while

preparing for the PFA or seek fitness restrictions to avoid failing a PFA, which can have significant administrative repercussions for the member. Additionally, serious injuries or medical conditions may prevent members from deploying or relocating to remote locations. Some patients recognize their injuries as minor or self-limiting, and if not for the upcoming PFA, they would not make the appointment. Subsequent referrals to physical and occupation therapy, orthopedics, pain management, and behavioral health are sometimes made for reasons other than medical necessity. My fellow clinicians have raised similar concerns over the years, yet no evidence has been collected to contextualize the problem. With this in mind, I examined the USAF fitness policy's efficiency and health care utilization.

Role of the DNP Student

I work as a family nurse practitioner in the family health clinic at a U.K.-based USAF MTF. Since joining the military in 2004 as a registered nurse and becoming a nurse practitioner, I praised the USAF for encouraging fitness for all airmen. As the years went by, I realized that the PFA as a performance measure of the USAF's fitness program is flawed. As a health care provider, I encourage my patients to exercise regularly in ways they find effective and sustainable. The reality is that not everyone enjoys activities such as running, push-ups, and sit-ups, and those activities are assessed during the fitness test. Additionally, failing a fitness test carries significant career repercussions for the affected member, especially if it is a repeated offense. Active duty military members are required to report medical ailments that may affect their duty or fitness performance. In response, health care providers may issue an Air Force Form 469 or what is referred to as

a *profile*. I am not alone in noting that profile-seeking behavior patterns have been observed in the clinical setting with patients asking to alter the components of a fitness test for a variety of reasons, even if their health care needs are being met. As a health care provider, I needed to account for population selection bias by using rigorous selection criteria to avoid misleading results.

Summary

Scholarly evidence on the relationship between the timing of the physical fitness assessment and the health care utilization rate was lacking. As a nurse in an advanced practice role, I addressed this gap in nursing practice in this doctoral project. Donabedian's framework and the logic model, which are described in Section 3, were used to guide the process.

Section 3: Collection and Analysis of Evidence

Meeting physical fitness standards is a condition for continued service in the USAF (USAF, 2013). The aspiration of having a physically fit force is aligned with the national evidence-based guidelines that promote regular physical activity in hopes of improving health outcomes and reducing long term healthcare costs (HHS, 2016). An increase in fitness levels among military members was shadowed by an increase in injuries, potentially hindering the members' readiness to deploy (Giovannetti et al., 2012). Additionally, passing a PFA does not correlate to combat type functional fitness (Worden, 2009). The purpose of this study was to determine the relationship between the timing of fitness testing and the health care utilization rate.

Practice-Focused Question

Among the active duty service members assigned to the U.K.-based USAF military treatment facility (MTF), what is the nature of the relationship between the timing of the PFA and the health care utilization rate? A quantitative correlational research design was used to determine the relationship between the two variables: the physical fitness assessment date and health care utilization rates among active duty service members assigned to the MTF. According to Burns and Grove (2009), examining a single group using two or more variables allows the researcher to explore the relationship between the variables, which was the purpose of this study. A correlational design focuses on events that have already occurred or are currently occurring, without manipulation (Burns & Grove, 2009). This type of study may be conducted to generate hypotheses for future research.

Sources of Evidence

After obtaining approval from the USAF and Walden University's institutional review board (10-16-17-0335654), I obtained a data sharing agreement with the Defense Health Agency to search for pertinent health care utilization data. A data sharing agreement was not required for the fitness data. Sources of existing data are shown in Table 2.

Table 2

Sources of Evidence

Required data	Source
Population sample demographics	Air Force fitness management system II (AFFMS II) accessible by the unit fitness program managers (UFPMs)
Fitness data <ul style="list-style-type: none"> - PFA dates - Exempt members 	AFFMS II accessible by the UFPMs
Healthcare utilization <ul style="list-style-type: none"> - Medical appointment frequency 	MHS data repository (MDR)/management analysis and repository tool (M2) accessible by the group practice manager (GPM)

After initial data collection and processing, I amended the proposed study protocol to include secondary statistical analyses. Correlational analysis including the Spearman's rho nonparametric statistical technique was used to determine the strength and direction of the relationship between the variables (see Palant, 2007). Additional analyses included a one-way repeated measures ANOVA and a paired-samples *t* test, which were used to look for differences in appointment utilization and their associated significance at different time intervals preceding the PFA test month.

Analysis and Synthesis

First, the unit fitness program managers (UFPMs) obtained PFA data on all 649 active duty hospital personnel using AFFMS II, a secure database used for collecting and managing military members' fitness data. The second step involved examining the fitness data for members who were exempted from testing on all PFA components resulting in one male and 30 female members being eliminated from the data set. During the third step, the hospital's group practice manager queried the M2 database for health care utilization data for the population, and created an Excel spreadsheet while simultaneously assigning random identification numbers to each member. With the M2 repository data lagging by 1 month and members' fitness data only accessible at 6-month intervals (there was no reliable way to determine whether members were on a 6- or 12-month testing cycle), the search within the M2 database was limited to 6 months prior to each members' PFA month through 3 months after it. Initial analysis revealed one outlier having 69 health care visits during the 9-month time frame, which was removed. The final sample meeting the study's inclusion criteria included 361 personnel.

Next, data were coded in the Excel program so they could be easily transferred into the SPSS software. Population demographics included the following categories: gender (male or female), age (number of years old, less than or greater than 30 years old), body mass index (BMI) scores, fitness (composite scores and individual component scores), rank (airman, noncommissioned officer, senior noncommissioned officer, company grade officer, field grade officer), and squadron (medical group staff, medical operations, medical support, inpatient services, surgical services, aeromedical, and

dental). Finally, health care utilization data were sorted into nine columns to reflect the number of times the member kept his or her medical appointment in a given month, ranging from 6 months prior to 3 months after the member's PFA month. The final merged data set was transferred into the SPSS software, which was used to conduct correlational and secondary statistical analyses.

Limitations

There were several limitations in data collection. To obtain relevant fitness data, squadron level unit fitness program managers (UFPMs) had to be contacted individually. There are dozens of squadrons in the wing, which would have required a significant investment in time and effort. For these reasons, the study was limited to the active duty service members assigned to work in the U.K.-based USAF hospital. Additionally, each unit's mission is unique, with a variety of occupational and cultural implications. Considering these limitations, the study's results are not generalizable to other units within the Wing or medical units within the continental United States, even though findings may contribute to the military's body of knowledge and inform future policies.

Another limitation was related to the M2 database and the type of health care utilization data collected. The database is limited to tracking health care encounters that occurred in the military treatment facilities (MTFs). If the member was seen by the specialist in the civilian sector, the specialty consult notes were scanned into the electronic health record (EHR) in a separate database. Although most off-base specialty clinics send a copy of each encounter to the referring MTF, some only send a summary of the evaluation, and sometimes they can get lost in transit. This MTF is a hospital with a

variety of specialty and surgical services, excluding cardiology, endocrinology, gastroenterology, and neurosurgery, enabling the M2 database to capture most specialty visits for the active duty population. These capabilities mitigated the aforementioned limitation.

In addition, some service members may be required to fit test more than once a year for various reasons. The data obtained from the UFPMs do not distinguish between 6- and 12-month testing cycles and only provide the last PFA date, pertinent scores, and the member's future test date. The future PFA date depends on the score and presence or absence of any fitness restrictions. Additionally, some members are required to test early to avoid PFA expiring during a deployment or when transitioning between assignments. Without cross-referencing the EHR and another deployment readiness databases, prior PFA dates could not be determined. In the future, PFA data could be collected over time, controlling for the testing cycles.

Summary

In this section, the processes of data collection and analysis were detailed, including practice-focused questions, relevant sources of evidence, and limitations of the study. Findings and recommendations are discussed in the next section.

Section 4: Findings and Recommendations

There was a gap in knowledge regarding the impact of the USAF's current fitness policy on health care utilization in the military health system (MHS). Health care providers are aware of USAF members' physical fitness requirements and are mandated to consider the members' health issues and how they may affect the members' occupation. Physical fitness assessment (PFA) results carry weight when it comes to career progression, creating an environment in which members seek health care for reassurance, treatment, or fitness waivers to avoid testing on various PFA components. There is no dedicated metric that provides feedback to the senior leadership informing them of the fitness program's cost in terms of health care utilization. The purpose of this study was to determine the nature of the relationship between the timing of the PFA and health care utilization among active duty service members assigned to the U.K.-based USAF hospital.

After receiving the USAF's and Walden University's institutional review board's approval and obtaining the required data sharing agreement (DSA) via the Defense Health Agency, I began data collection. The hospital's unit fitness program managers (UFPMs) with AFFMS II access were contacted. All seven UFPMs provided the requested personnel fitness data. The hospital's group practice manager assisted with accessing the M2 database, creating an Excel spreadsheet, and merging the two data sets into one document. Members' identities were protected according to the executed DSA. Data in the Excel spreadsheet were then transferred to SPSS, which I used to perform appropriate statistical analyses.

Statistical analyses were conducted with SPSS Version 24.0 using a 0.05 significance level. Preliminary data analyses included correcting for missing values and determining whether the data met assumptions for normal distribution and equal variances. There were no missing data. The variables of interest were not normally distributed, calling for changes in the study's protocol to include nonparametric Spearman's rho correlation coefficient, one-way repeated measures ANOVA, and paired-samples *t* tests.

Findings and Implications

A total of 361 active duty service members were included in the study sample. Their characteristics were grouped by military rank and are shown in Figure 1. The service members were young ($M = 30.8$, $SD = 8.40$), maintained a healthy BMI ($M = 25.5$, $SD = 3.54$), earned excellent composite physical fitness assessment scores ($M = 92.24$, $SD = 5.93$), and saw a health care professional approximately five times ($M = 4.73$, $SD = 4.74$) in the 6 months prior to the physical fitness test date. Nineteen (5.3%) members had zero visits noted in the M2 database. Most of the sample were under the age of 30 ($n = 192$, 53%), had a BMI of less than 30 ($n = 320$, 88.6%), and scored excellent (above 90%) on their PFA ($n = 249$, 68.9%). The Centers for Disease Control and Prevention (CDC, 2017) reported that 36.5% of the U.S. population are considered obese with a BMI above 30, compared to the 21.4% of the study sample, and that 83.6% of adults had contact with a health care professional in the past year. Theoretically, 100% of the active duty population have contact with a health care professional to complete a physical health assessment every 12 months, which is higher than the national average.

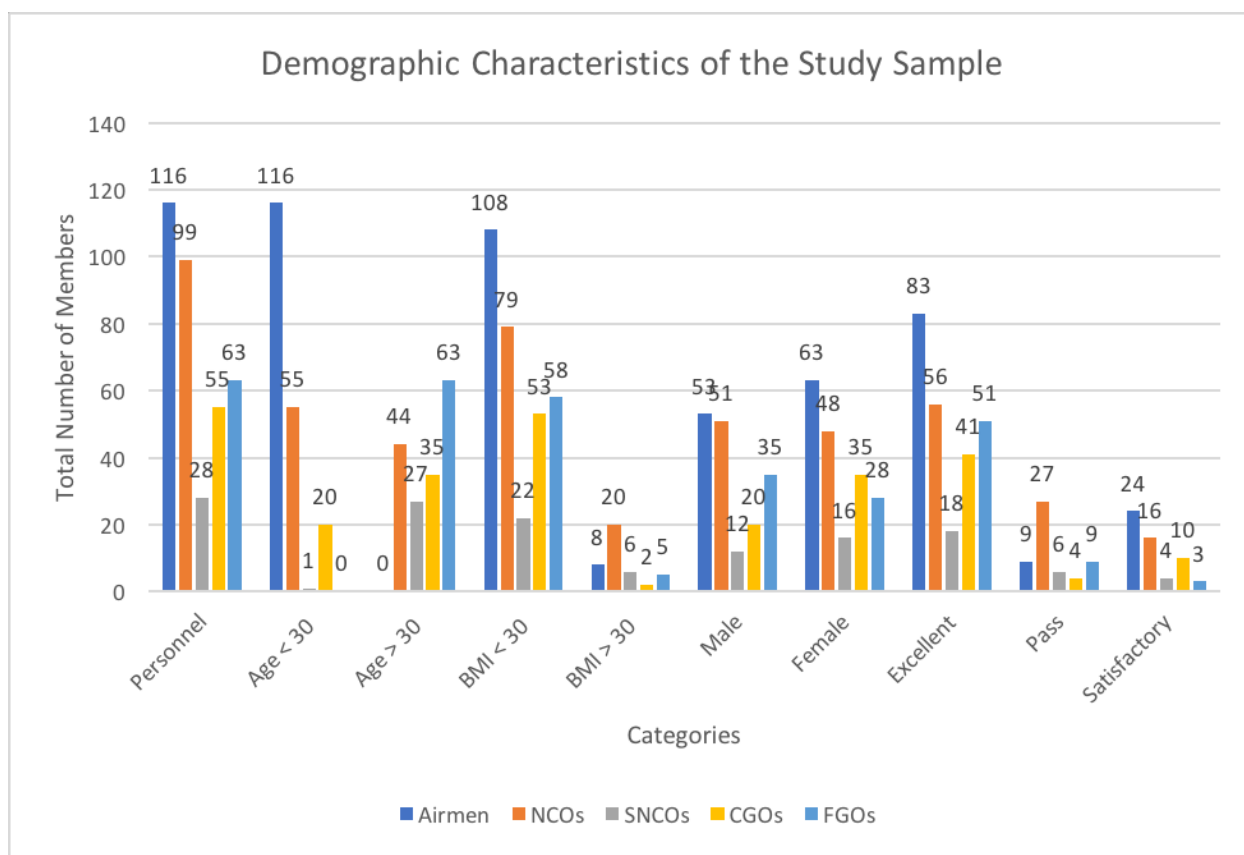


Figure 1. Demographic characteristics of the study sample.

Figure 2 demonstrates the study sample's health care utilization (HU) focusing on 6 months prior to the PFA and 3 months after the PFA. The HU was higher 1 month prior (T-2) to and during the PFA month (T-1), and returned to baseline 1 month after. The relationship between the timing of PFA and HU was investigated using Spearman's rho correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a strong, positive correlation between the two variables, $r = .58$, $n = 361$, $p < .0005$, with higher utilization associated within a month of the PFA, as shown in Table 3.

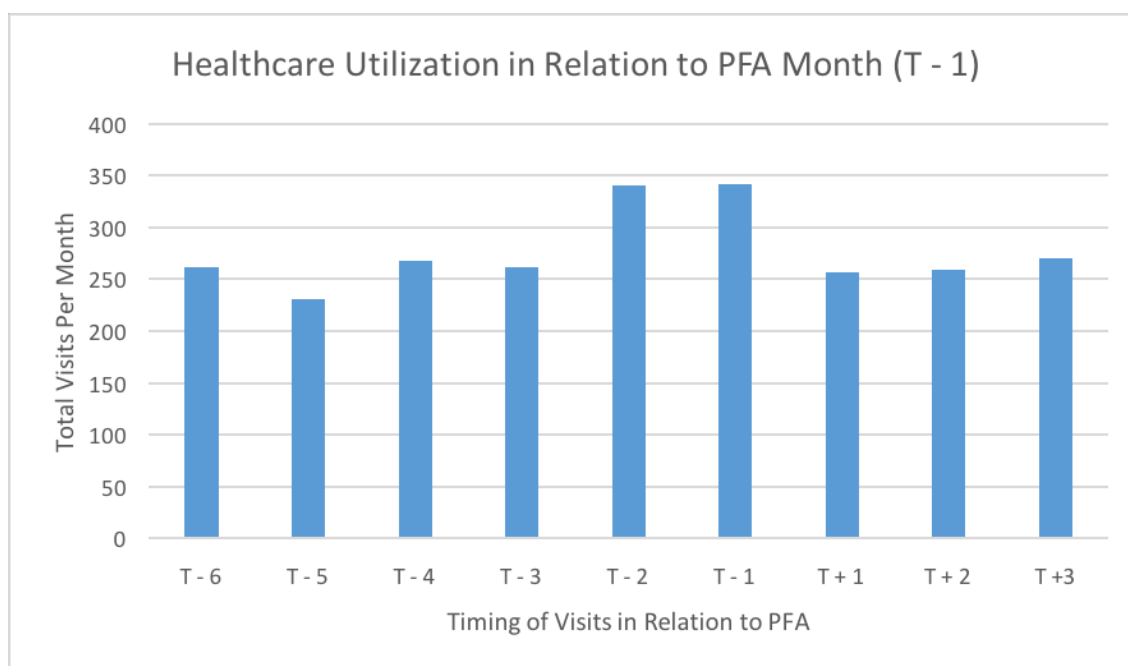


Figure 2. Health care utilization in relation to PFA month (T-1).

A one-way repeated measures ANOVA was conducted to compare appointment utilization at different time intervals prior to physical fitness assessment (PFA). The means and standard deviations are presented in Table 4. There was a significant effect for time, Wilks' Lambda = .95, $F(5, 356) = 3.72$, $p < .003$, multivariate partial eta squared = 0.05.

A paired-samples t test was conducted to evaluate the impact of the approaching physical fitness test on the appointment utilization, shown in Table 5. There was a statistically significant increase in appointment utilization from T-5 ($M = .64$, $SD = 1.11$) to T-1 ($M = .95$, $SD = 1.44$) and T-2 ($M = .94$, $SD = 1.45$), with $t(360) = -.360$, $p < .0005$ (two-tailed) and $t(360) = -3.51$, $p < .001$ (two-tailed), respectively. For these pairs, the mean increase in appointment utilization was $-.307$ with a 95% CI $[-.476, -.139]$ and -

.305 with a 95% CI [-.475, -.134]. The eta squared statistic (.03) for both pairs indicated a small effect size.

Table 3

Correlations

			T-6	T-5	T-4	T-3	T-2	T-1	Total visits
Spearman's rho	T-6	Correlation Coefficient	1.000	.395**	.243**	.173**	.075	.198**	.538**
		Sig. (2-tailed)		.000	.000	.001	.157	.198	.000
	T-5	Correlation Coefficient			.306**	.265**	.144**	.172**	.566**
		Sig. (2-tailed)			.000	.000	.006	.001	.000
	T-4	Correlation Coefficient				.262**	.077	.168**	.508**
		Sig. (2-tailed)				.000	.147	.001	.000
	T-3	Correlation Coefficient					.271**	.222**	.534**
		Sig. (2-tailed)					.000	.000	.000
	T-2	Correlation Coefficient						.240**	.544**
		Sig. (2-tailed)						.000	.000
T-1	Correlation Coefficient							.576**	
	Sig. (2-tailed)							.000	
Total Visits	Correlation Coefficient								
	Sig. (2-tailed)								

Note. **Correlation is significant at the $p < 0.01$ level (2-tailed).

Table 4

Descriptive Statistics for Appointment Utilization at Different Time Intervals Prior to Physical Fitness Assessment (PFA) Month

Time period	Mean	SD	N
T-1 (PFA month)	.95	1.440	361
T-2 (2 months prior)	.94	1.488	361
T-3 (3 months prior)	.73	1.218	361
T-4 (4 months prior)	.74	1.099	361
T-5 (5 months prior)	.64	1.105	361
T-6 (6 months prior)	.73	1.209	361

Table 5

Paired-Samples Test

		Paired differences			95% Confidence Interval of the Difference		<i>t</i>	df	Sig. (2-tailed)
		Mean	<i>SD</i>	<i>SD</i> Error Mean	Lower	Upper			
Pair 1	T-5 – T-1	-.307*	1.625	.086	-.476	-.139	-3.595	360	.000
Pair 2	T-2 – T-1	-.003	1.694	.089	-.178	-.173	-.031	360	.975
Pair 3	T-5 – T-2	-.305*	1.649	.087	-.475	-.134	-3.512	360	.001

Note. *Significant at the $p < 0.05$.

Inability to view retrospective evidence beyond most recent PFA in the AFFMS II database limited the scope of the study. If these data were available, data trending would have been possible. Review of these data would also have offered an opportunity to control for the PFA testing cycle as a variable. However, this limitation was not anticipated due to the unfamiliarity with this database.

In this study of 361 active duty military members assigned to the U.K.-based USAF hospital, there was a strong, positive correlation between the timing of the PFA and HU, which was strongest during the PFA month. This DNP project addressed the gap in practice knowledge. Although these findings are not generalizable throughout the Air Force, the study set a precedent for further research to address health care utilization variability between USAF bases and sister services, to identify at-risk populations, and to develop focused interventions. Continuation of this DNP project may drive social change by promoting nursing research through interdisciplinary collaboration, inspiring

innovation in military nursing, and encouraging evidenced-based and cost-conscious policies.

Recommendations

There are several recommendations that deserve attention. The project needs to be expanded to include all military USAF personnel. There needs to be a project team that can successfully lead a service-wide research study. The team will need to include a statistician as well as an administrative liaison overseeing documentation and communication with various agencies. This small study took a considerable amount of resources in terms of time, workload, and communication. It took nearly 6 months to go from the initial inquiry regarding the institutional review board (IRB) and the final data sharing agreement approvals. In addition, initial data collection and analysis led to a minor protocol amendment requiring a second IRB request through the USAF and Walden University. Also, cross-referencing the information from the AFFMS II and M2 databases with the actual electronic health record (EHR) was not feasible. Conducting a case series at several military treatment facilities (MTFs) may add to the breadth and depth of this research. Future studies can be prospective or retrospective in nature, involving an EHR review and inquiry on the reason for visit, or a combination of both. If the deeper assessment of the issue confirms this study's findings, the evidence can be used to inform USAF's health care and fitness policies with respect to the health care cost burden. However, if the effect size remains small and the savings are not worthwhile, the Department of Defense may choose to keep current policies in place.

Strengths and Limitations of the Project

This project was strengthened by its large sample size ($N = 361$) and a variety of squadrons included. The study focused on medical squadrons, but the protocol can be replicated at other bases. The project's limitations include both population and systems issues. With the sample being limited to hospital personnel, the findings are not generalizable to other groups at this particular base or other bases in Europe. Further, health care utilization information within the M2 database does not include civilian sector specialty care; therefore, it would be important to work with the TRICARE referral management center to provide these data. This would be a crucial step if the study involved smaller MTFs that provided limited specialty services. Lastly, AFFMS II database limitations need to be considered as well, because AFFMS II does not maintain members' fitness records prior to the last physical fitness assessment.

A less arduous research process must exist for the advanced practice nurses or any other health care provider in the military to foster an active professional scholarship role. The military treatment facility's (MTF) senior leadership should consider creating and maintaining an accessible research resource guide that is adapted to the locale. For example, there is no institutional review board (IRB) overseas, and it was challenging to find out which stateside site would accept the proposal. Luckily, this study's proposal qualified for an expedited IRB review, which had a quicker turnaround. Moreover, determining where and how to obtain data sharing agreements proved to be challenging and time consuming. Developing a central repository for such information and linking it to the military's online IRB website would be helpful. Having these types of resources

readily available to all military health care professionals would encourage practice innovation, personal growth, and job satisfaction.

Section 5: Dissemination Plan

“Research findings are not complete until the findings are communicated to others” (Oermann & Hays, 2016, p. 97). The Association of Military Surgeons of the United States (AMSUS) publishes peer-reviewed scientific papers, case reports, and editorials in a journal titled *Military Medicine*, with the objective to promote awareness of federal medicine and share knowledge common to federal health care providers. It is recommended to match the topic, type of article, and an intended audience with the journal (Oermann & Hays, 2016). Submitting a manuscript to the *Military Medicine* journal is a good choice, considering the fact that several of the studies used to inform this project were published in it. Oermann and Hays (2016) warned that poorly matched journals can result in the editor’s rejection, peer experts’ rejection due to poor fit, and lack of exposure to the intended audience. Moreover, valuable time may be lost in the process. With that in mind, selecting an appropriate format for dissemination should be considered early in the process. If my manuscript is selected for publication in the *Military Medicine* journal, it has the potential to inform those who determine health care and fitness policies. Translating evidence to inform policy is challenging because of the lack of personal contact between researchers and policymakers, lack of timeliness or relevance of research, and mutual mistrust (White, 2016).

Another way to disseminate the findings would be to present them at a relevant conference. AMSUS holds annual meetings that involve senior federal health care professionals and international delegates. Either an oral presentation or a poster presentation (or both) would be appropriate. Knowledge sharing is vital to all eight

essentials of doctoral education for advanced nursing practice. Therefore, dissemination of the DNP project in an appropriate format is key to the advance practice nurse's development as a scholar and nurse leader.

Analysis of Self

Doctorate-prepared nurses are charged with advancing the nursing profession through leadership and a scholarly approach to practice (AACN, 2006). This professional commitment enables the advance practice nurses to get involved in health care quality improvement initiatives, improve patient health outcomes, and inform health care policy. These concepts are interdependent. For example, it took significant leadership skills to work on this project, with further plans to disseminate evidence leading to improved health outcomes, influencing health care policy. Reflecting on the past several years, leadership demands required courage to ask questions, network, and function outside of my comfort zone.

A less arduous research process is needed for the advanced practice nurses or other health care providers in the military to foster an active professional scholarship role. The military treatment facility's (MTF) senior leadership should consider creating and maintaining an accessible research resource guide that is adapted to the locale. For example, there is no institutional review board (IRB) overseas, and it was challenging to find out which stateside site would accept the proposal. Luckily, this study's proposal qualified for an expedited IRB review, which had a quicker turnaround. Moreover, determining where and how to obtain data sharing agreements proved to be challenging and time consuming. Developing a central repository for such information and linking it

to the military's online IRB website would be helpful. Having these types of resources readily available to all military health care professionals would encourage practice innovation, personal growth, and job satisfaction.

These valuable experiences challenged me as a person and as a professional. On a personal level, I have improved my project management skills by learning evidence-based theories and techniques. Working on this project deepened my understanding of the importance of organizational and systems leadership, the utility of information systems, and the importance of getting politically involved to positively influence health care delivery.

Summary

This DNP project bridged a gap in knowledge and provided impetus for further scientific inquiry. Findings indicated a strong, positive relationship between the timing of the physical fitness assessment (PFA) and the health care utilization (HU) rate at the U.K.-based military treatment facility (MTF). HU appears to be significantly higher during the PFA month and one month prior to it, although the effect size was small. There were several limitations related to sampling and data collection; however, the sample size and MTF capabilities mitigated these limitations. Disseminating these findings in a peer-reviewed journal, presenting them at a military conference, and expanding the research study service-wide utilizing a multidisciplinary project team are recommended actions.

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